

SELECTIVELY DEFERRING THE EXECUTION OF INSTRUCTIONS WITH UNRESOLVED DATA DEPENDENCIES AS THEY ARE ISSUED IN PROGRAM ORDER

ABSTRACT

One embodiment of the present invention provides a system that facilitates deferring execution of instructions with unresolved data dependencies as they are issued for execution in program order. During a normal execution mode, the system issues instructions for execution in program order. Upon encountering an unresolved data dependency during execution of an instruction, the system generates a checkpoint that can subsequently be used to return execution of the program to the point of the instruction. Next, the system executes subsequent instructions in an execute-ahead mode, wherein instructions that cannot be executed because of an unresolved data dependency are deferred, and wherein other non-deferred instructions are executed in program order.